



ROADSIDE OBSERVATION SURVEY
OF
SAFETY BELT AND MOTORCYCLE HELMET USE IN INDIANA

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1.0 Executive Summary

This report summarizes the findings of the 1999 Indiana roadside observation survey of safety belt and motorcycle helmet use. The survey observations were collected during the September 13 through September 27, 1999 interval. The work of planning and conducting the survey was performed by the Purdue University Automotive Transportation Center. The Governor's Council on Impaired & Dangerous Driving and the National Highway Traffic Safety Administration (NHTSA) sponsored the survey and provided guidance and assistance.

This 1999 report describes the twenty-third Indiana safety belt survey. This series of surveys has documented safety belt use by front-seat occupants of passenger cars on Indiana roadways, beginning with a use rate of less than 25 percent in 1985. An immediate increase to nearly 50 percent was noted when the Indiana Mandatory Safety Belt Use Law went into effect in mid-1987. Between 1988 and 1997, the survey series documented increases for passenger cars with a 1997 usage rate of 62.3 percent. The usage rate for front-seat occupants of passenger cars was 68.6 percent in September of 1998 and decreased to 63.3 percent in the most recent September 1999 survey, a 5.3 percent decrease. For all passenger vehicles (including pickup trucks) the decrease in usage was less—a 4.5 percent decrease from 61.8 percent in 1998 to 57.3 percent in 1999. Decreases in usage rates were observed in all road classes and regions (urban versus rural). The most significant decreases were seen in “Urban Local Roads” - a 10.7 percent decrease and a 6.7 percent decrease for “Urban Collectors.” Safety belt usage rates by female drivers dropped to 63.7 percent from 69.6 percent (1998) while usage rates by male drivers decreased by 4.3 percent to 51.0 percent. Usage rates by passengers also declined by 2.9 percent. These decreases were observed in all three age groupings. A summary of the 1999 findings versus those collected in September 1998 is presented in the table below.

Table 1: Safety Belt Usage Summary, 1998-1999

Vehicle Type	1998		1999		98 - 99 Change
	Percent Restrained		Percent Restrained		in Weighted
	Weighted	Unweighted	Weighted	Unweighted	% Restrained
Cars	68.6%	67.7%	63.3%	62.7%	-5.3%
Pickups	38.0%	33.5%	33.5%	30.4%	-4.5%
Other Pass.	65.3%	64.9%	61.8%	61.4%	-3.5%
All Pass.	61.8%	60.3%	57.3%	55.9%	-4.5%

Legend: Other Pass. = Large Vans, Mini-vans and Sport Utility Vehicles

All Pass. = All non-commercial passenger vehicles

Source: Roadside Observation Survey of Safety Belt and Motorcycle Helmet Use in Indiana, 1999

Motorcycle helmet usage rate for 1999 was calculated to be 37.6 percent, an increase from 33.4 percent in 1998. As in 1998, passengers exhibited a higher helmet usage rate (41.3 percent unweighted) than drivers (38.8 percent).

To aid the enforcement community, the typical non-user can be described as a young male (age 16-34), driving a passenger car on a local road in Indiana. The driver may or may not have another male passenger accompanying him.

From a legislative perspective, the greatest impact on increasing safety belt use can be gained through passage of a bill that includes the pickup vehicle as part of the primary safety belt law.

2.0 Survey Design

2.1 Introduction

The 1999 Indiana Roadside Observation Survey of Safety Belt and Motorcycle Helmet Use is the twenty-third in a series of surveys originally designed in 1985. The first through seventeenth surveys (1986 through 1993) were all conducted using a common protocol. In 1994, the survey was redesigned in conformance with guidelines published in the *Federal Register* [vol. 57, no. 125, June 2, 1992: 2889928904] by the National Highway Traffic Safety Administration; the revised design was discussed in the 1994 report (see also the 1998 report). For 1994 and earlier surveys, reporting was confined to passenger cars. This 1999 survey is a replication of the 1995 survey design, with several modifications to the field protocols implemented for the 1998 survey, as discussed in Section 2.3.

In 1995, the survey was modified to permit reporting for a wider variety of vehicle types, including minivans, sport-utility vehicles and pickup trucks. Large passenger vans were included for the first time in the 1998 survey as required by new NHTSA regulations. In accordance with these new regulations, no distinction is made between in-state and out-of-state licensed vehicles. All vehicles identified as commercial were excluded.

The 1998 survey was the first conducted after the passage of the Indiana primary or standard safety belt law that became effective July 1, 1998. The law was being enforced by some, but not all, police agencies during the data collection period. The 1999 survey was conducted approximately three months after the Indiana Supreme Court upheld the standard safety belt law.

While planning for the 1998 data collection, it was determined that, by switching to a cluster procedure for grouping observation locations by day and time, the total number of observation locations could be increased by 25 percent without incurring increased data collection costs. In reviewing the sites used in 1997, it was discovered that the number of sites and amount of data collected representing certain roadway functional classes (primarily rural and urban local roads) were far less than desired if the survey was to meet NHTSA's probability based requirement for site selection. It was decided to retain as many of the 1997 sites as feasible to ensure comparability of the 1998 survey with previous years and to select new sites to reduce the imbalance in functional roadway class data. A new weighting scheme was selected to adjust the observed safety belt use rates to the most recent (1997) Indiana functional class vehicle miles traveled (VMT) estimates. Section 2.2 further discusses site selection and roadway functional classes.

Field observations for the 1999 survey were collected between September 13-27, 1999. The observations were collected at 161 different roadside locations in 24 counties. At each location, the observer scrutinized passing traffic and recorded shoulder strap use for exactly 60 minutes. The observation sessions were limited to daylight hours (6:30 a.m. - 6:30 p.m.), giving 12 one-hour slots each day and 84 one-hour slots for the seven days of a week. The 161 observation sessions were grouped into clusters, and sites within each cluster were randomly scheduled such that each of the 84 slots was used at least once. As required by NHTSA regulations, data were collected on all days of the week and at all times during daylight hours.

There were 161 data collection sites, located in the following 24 counties:

2 Allen (14)	23 Fountain (5)	34 Howard (7)	56 Newton (4)
10 Clark (8)	24 Franklin (4)	36 Jackson (7)	62 Perry (4)
12 Clinton (5)	26 Gibson (5)	46 LaPorte (9)	64 Porter (12)
14 Daviess (5)	30 Hancock (7)	49 Marion (14)	69 Ripley (5)
16 Decatur (5)	32 Hendricks (8)	50 Marshall (5)	79 Tippecanoe (8)
17 DeKalb (5)	33 Henry (6)	55 Morgan (5)	80 Tipton (4)

2.2 Survey Revisions Initiated in 1998

In 1998, a 25 percent increase in sites was desired. Most (112 of the 128) of the 1997 sites were retained with 16 replacement and 33 additional new sites selected.

The selection of new and replacement sites was done to reflect the distribution of roadway types found in the state. The procedure used to select sites was as described in the 1994 Report for choosing local sites (see Appendix A). The roadway types are taken from the FHWA functional classes^{3/4} a classification system that is based upon the type of service the street or highway is intended to provide. The roadway classes and their derivative FHWA functional class codes are as follows:

Freeways: Interstates: Limited access, divided facilities of at least four lanes and designated by the Federal Highway Administration as part of the Interstate System. Rural: FC=1; Urban: FC=11

Other Freeways and Expressways: All urban principal arterial with limited control of access not on the Interstate system. FC=12

Arterials: Other Principal Arterials: Major streets or highways, many with multi-lane or freeway design, serving high-volume traffic corridor movements that connect major generators of travel. Rural: FC=2; Urban: FC=14

Minor Arterials: In rural areas, streets and highways linking cities and larger towns. Rural: FC=6; Distributing trips to small geographic areas in urban areas (not penetrating identifiable neighborhoods). Urban: FC=16

Collectors: In rural areas, routes serving intra-county, rather than statewide travel. Major Rural: FC=7, Minor Rural: FC=8. In urban areas, streets providing direct access to neighborhoods as well as direct access to arterials. Urban: FC=17

Local: Local Streets and Roads. Streets whose primary purpose is feeding higher order systems, providing direct access with little or no through traffic. Rural: FC=9; Urban: FC=19

In both the 1998 and 1999 surveys, data on the gender and age of front-seat occupants were collected at all 161 locations. This was done to remove any bias in this data due to different patterns in safety belt use for high volume sites not represented in the 1995–1997 data. The 1998 and 1999 surveys include estimates for safety belt use by occupants of pickup trucks and for all passenger vehicles. Supplemental counts of all passenger vehicles were conducted for a ten-minute period at each site. This count was used to estimate the hourly passenger vehicle volume for each vehicle class whenever the traffic volume exceeded the ability of the observer to note and code all of the desired data for all passenger vehicles traveling in either direction on the designated road. Procedures for collecting the supplemental counts are described in Appendix A.

2.3 Motorcycle Helmet Use

Collection of in-transit motorcycle data was continued in 1999 with additional information on the roadway functional class needed to determine whether there is a relationship between roadway class and helmet use.

Reporting on motorcycle helmet use was inaugurated in 1994, as specified by the NHTSA guidelines in the *Federal Register*. Under these guidelines, observations of motorcyclists to ascertain helmet use must be regarded as a convenience sample collected as an adjunct to the primary mission (to observe safety belt use). The experience gained during the 1994 through 1996 surveys indicates that relatively few motorcycles are observed at the observation locations.

Beginning with the 1997 survey, the motorcycle observation protocols were modified in two ways. First, observations collected for motorcycle drivers and motorcycle passengers were coded and analyzed sepa-

rately. Second, the observers recorded motorcycle helmet observations while they were in transit from one location to another. In this manner, the number of motorcyclists observed was increased. The observations collected in transit were recorded separately from the observations collected on site.

Upon analysis of the 1997 motorcycle data, it was discovered that the helmet usage rate was higher (48.2 percent) for the data collected in transit than for the data collected at observation sites (38.7 percent). Since most of the travel mileage was on rural interstates and arterials, it was hypothesized that helmet usage varies by roadway class. Since the on-site data included all motorcyclists observed at the site, it could not be assumed that the roadway class for the motorcycle data was identical to the other passenger vehicle data. In preparing for the 1998 survey, the roadway class for intersecting roads was determined and the data collection procedure was modified such that observers noted all instances when an observed motorcyclist was traveling on an intersecting road rather than the designated road for a site. No other changes were made in establishing the 1999 survey protocols.

3.0 Results

Table 1a: Safety Belt Usage Summary, 1998-1999

Vehicle Type	1998		1999		Relative Precision	95 Percent Confidence Interval	98 - 99 Change in Weighted % Restrained
	Percent Restrained		Percent Restrained				
	Weighted	Unweighted	Weighted	Unweighted			
Cars	68.6%	67.7%	63.3%	62.7%	1.4%	61.5% - 65.0%	-5.3%
Pickups	38.0%	33.5%	33.5%	30.4%	3.1%	31.4% - 35.5%	-4.5%
Other Pass.	65.3%	64.9%	61.8%	61.4%	2.3%	59.0% - 64.6%	-3.5%
All Pass.	61.8%	60.3%	57.3%	55.9%	1.5%	55.6% - 59.0%	-4.5%

Legend: Other Pass. = Large Vans, Minivans and Sport-Utility Vehicles

All Pass. = All non-commercial Passenger vehicles

Source: Roadside Observation Survey of Safety Belt and Motorcycle Helmet Use in Indiana, 1999

Drivers overall had a slightly higher unweighted usage rate of 56.1 percent than front-seat passengers (55.0 percent). Female drivers had higher usage rates (63.7 percent) than male drivers (51.0 percent). Likewise, the female passenger rate was 61.1 percent compared to 42.9 percent for male front-seat passengers. The Young Adult age group (ages 16-34) had the lowest usage rate as either a driver (53.5 percent) or a front-seat passenger (45.6 percent). Occupants of pickup trucks continued to trail all other passenger vehicle occupants in weighted restraint use at 33.5 percent (unweighted 30.4 percent). Freeways had the highest usage rates of any roadway classification and, for other roadway classifications, rates were consistently higher in urban areas. The lowest weighted usage rates (40.4 percent for all passenger vehicles and 20.1 percent for pickup truck occupants) were observed on rural local roads.

The estimates for safety belt and motorcycle helmet use presented in this report were based on the following raw data tallies:

<u>Number/Type of Vehicles Observed</u>	<u>Number of Occupants/ Motorcyclists</u>
16,956 passenger cars/station wagons	21,750 occupants
698 large vans	916 occupants
2,856 minivans	3,812 occupants
3,089 sport-utility vehicles	3,967 occupants
6,279 pickup trucks	7,759 occupants
981 motorcycles	1,204 motorcyclists

The overall weighted helmet usage by motorcyclists was 37.6 percent. The 259 observed motorcycle passengers had a somewhat higher unweighted usage rate of 41.3 percent than the 38.8 percent usage rate for the 981 observed drivers.

Survey operations and the results are discussed in greater detail in the body of this report. The original survey data are available through The Governor's Council on Impaired & Dangerous Driving, Office of Traffic Safety.

3.1 Restraint Usage by Gender and Role

The analysis of restraint usage patterns for drivers versus passengers and males versus females is across all sites and based upon unweighted usage rates. Front seat occupants for whom the observer did not make a gender judgement are excluded from this analysis. As seen in Table 2, drivers overall had a slightly higher usage rate of 56.1 percent compared to 55.0 percent for front seat, outboard passengers.

Table 2: Indiana 1999 Unweighted Restraint Usage by Vehicle Type, Gender and Role

Vehicle Type	All Drivers				Front-Seat Passengers				Eligible Occupants
	NR	U	R	Percent Restrained	NR	U	R	Percent Restrained	Percent Restrained
Cars	6,129	171	10,656	63.5%	1,869	143	2,782	59.8%	62.7%
Pickups	4,241	144	1,894	30.9%	1,013	62	405	28.6%	30.4%
Minivans	948	66	1,842	66.0%	288	51	617	68.2%	66.5%
Large Vans	415	47	236	36.3%	112	19	87	43.7%	38.0%
SUV	1,149	82	1,858	61.8%	319	49	510	61.5%	61.7%
All Pass.	12,882	510	16,486	56.1%	3,601	324	4,401	55.0%	55.9%
Vehicle Type	Female Drivers				Female Front-Seat Passengers				Both
	NR	U	R	Percent Restrained	NR	U	R	Percent Restrained	Percent Restrained
Cars	2,765	41	5,330	65.8%	1,119	50	2,069	64.9%	65.6%
Pickups	510	13	283	35.7%	493	15	274	35.7%	35.7%
Minivans	439	24	984	69.1%	195	25	464	70.4%	69.5%
Large Vans	123	13	85	40.9%	61	5	59	49.2%	43.9%
SUV	479	19	885	64.9%	195	22	371	65.5%	65.1%
All Pass.	4,316	110	7,567	63.7%	2,063	117	3,237	61.1%	62.9%
Vehicle Type	Male Drivers				Male Front-Seat Passengers				Both
	NR	U	R	Percent Restrained	NR	U	R	Percent Restrained	Percent Restrained
Cars	3,356	54	5,312	61.3%	743	35	700	48.5%	59.5%
Pickups	3,723	64	1,606	30.1%	508	9	129	20.3%	29.1%
Minivans	507	16	855	62.8%	90	6	145	61.7%	62.6%
Large Vans	291	19	151	34.2%	49	3	28	36.4%	34.5%
SUV	668	28	971	59.2%	121	5	135	52.7%	58.4%
All Pass.	8,545	181	8,895	51.0%	1,511	58	1,137	42.9%	49.9%

Note: Drivers and passengers with unknown gender included in totals.

Legend: R= Restrained; NR=Not Restrained; U=Unknown Restrained; All Pass.=All non-commercial Passenger vehicles; SUV=Sport-Utility Vehicles

Source: Roadside Observation Survey of Safety Belt and Motorcycle Helmet Use in Indiana, 1999.

Overall, female drivers had a 63.7 percent usage rate versus a 51.0 percent rate for male drivers and had higher rates for each vehicle type. The female driver rate declined 5.9 percent from 69.6 percent in 1998 and the male driver rate declined 4.3 percent from 55.3 percent in 1998. While there were significantly more male (17,621) than female (11,993) drivers, there were twice as many female (5,417) as male (2,706) front seat passengers. Female passengers overall had a 61.1 percent usage rate, which was lower than the female driver rate but much higher than the male passenger rate of 42.9 percent. The female passenger rate declined 2.3 percent from 63.4 percent in 1998 while the male passenger rate declined 3.7 percent from 46.6 percent in 1998.

Note that 85.9 percent of pickup truck drivers were male and these male pickup drivers had only a 30.1 percent usage rate. Male pickup passengers had the lowest restraint usage rate (20.3 percent) of any subgroup.

Additional analyses were performed on the Table 2 data to examine patterns in restraint usage by different gender pairings of front-seat occupants. Female drivers with no front-seat passengers had a usage rate essentially equal (63.6 percent) to that of all female drivers. The female driver rate was 64.8 percent when there was a female front-seat passenger and 63.5 percent when accompanied by a male front-seat passenger. Male drivers, on the other hand, exhibited different rates depending on the presence and gender of a front-seat passenger. Male drivers with a female front-seat passenger had a 62.0 percent rate, much higher than the 41.6 percent rate found when accompanied by a male front-seat passenger and almost as high as the overall female driver rate of 63.7 percent. Male drivers with no front-seat passenger had a restraint usage rate of 48.6 percent—a rate midway between that observed with male and female front-seat passengers.

Female front-seat passengers riding with a male driver had essentially the same restraint rate (62.0 percent) as female passengers with a female driver (61.8 percent). Male passenger restraint usage seemed to be much more related to the gender of the driver. When the driver was female, the male passenger rate was 58.9 percent, but when the driver was male, the male passenger rate was only 35.7 percent.

3.2 Restraint Usage by Age of Drivers and Passengers

The Young age group (ages 16-34) had the lowest restraint usage rate as either a driver or a front-seat passenger. As shown in Table 3, the age-related order from lowest to highest for Young, Child, Mid-Adult, and Older-Adult is the same for drivers and passengers. The lowest subgroup with a 45.6 percent rate was Young passengers (ages 16–34) and the highest was Older Adult passengers at 68.9 percent.

Table 3: Indiana 1999 Unweighted Restraint Usage by Age and Role

Drivers

	Young (16-34)		Mid-Adult (35-54)		Older Adult (55+)	
Vehicle	Percent		Percent		Percent	
Type	Count	Restrained	Count	Restrained	Count	Restrained
Cars	6,473	58.7%	7,468	65.7%	2,916	68.5%
Pickups	1,966	29.1%	3,306	30.6%	926	35.7%
Mini-vans	652	65.7%	1,854	65.4%	317	70.0%
Large Vans	109	31.8%	449	35.8%	122	43.1%
SUV	1,109	61.1%	1,747	61.9%	192	64.4%
All Pass.	10,309	53.5%	14,824	56.5%	4,473	61.0%

Passengers

	Child (6-15)		Young (16-34)		Mid-Adult (35-54)		Older Adult (55+)	
Vehicle	Percent		Percent		Percent		Percent	
Type	Count	Restrained	Count	Restrained	Count	Restrained	Count	Restrained
Cars	368	53.9%	1,563	48.4%	1,625	63.4%	1,125	73.2%
Pickups	139	31.6%	409	21.8%	644	28.9%	226	40.3%
Mini-vans	128	62.8%	206	61.1%	443	69.4%	144	77.9%
Large Vans	25	37.5%	36	28.6%	101	41.8%	43	67.5%
SUV	86	62.7%	270	55.5%	400	63.9%	85	73.5%
All Pass.	746	51.6%	2,484	45.6%	3,213	56.7%	1,623	68.9%

Note: Restraint Usage unknown not included.

Legend: All Pass. = All non-commercial Passenger vehicles; SUV = Sport-Utility Vehicles

Source: Roadside Observation Survey of Safety Belt and Motorcycle Helmet Use in Indiana, 1999.

In 1998, the difference in usage rates for drivers versus passengers was largest for the Young group with drivers having higher rates for each type of vehicle. In the 1999 survey, the Older Adult group had a similar magnitude (7.9 percent) difference between drivers and passengers with Older Adult passengers having a higher usage rate than Older Adult drivers.

Only 3 infants (down from 6 in 1998), all in child safety seats, and 92 (up from 46 in 1998) young children (ages 1-5) were noted by the observers as passengers in the right-front seat. These low rates of child front-seat occupancy are a positive finding since riding in the back seat is safer. The increase in the number judged to be between ages 1 and 5 should be monitored to see if the numbers of young children riding in the front seat is in fact increasing after years of improvement. Child safety seats restrained only 14.1 percent of the ages 1-5 group with an additional 15.4 percent using a safety belt. It should be noted that it is not possible to observe whether a child is restrained by a lap belt only and it is generally more difficult to determine if the shoulder belt is used for a small passenger. Also, in this survey no coding of data for front-center passengers was attempted. Pickups are the only vehicle type with a significant number of front-center passengers, and such passengers are frequently children. Observers also noted several infants or small children sitting in the lap of a passenger. These data were not systematically recorded. Thus, restraint rates for infants and young children can not be estimated with any degree of confidence from the 1999 survey. Children coded as occupying child safety seats were excluded from the safety restraint rate estimates.

3.3 Restraint Usage by Vehicle Type

When examined by vehicle type, 1999 data revealed that occupants of pickup trucks still lag all other passenger vehicle occupants in restraint usage. Overall only 33.5 percent (30.4 percent unweighted) of pickup occupants were belted (see Tables 1 and 2). This may reflect the fact that these vehicles are still exempt from Indiana safety belt laws. Large vans, however, which would in most instances be covered by the law, show just a 38.0 percent unweighted restraint usage. This is an area of concern, but large vans comprised only 2.3 percent of vehicles observed in the 1999 survey. Since pickup trucks comprised 21.0 percent of vehicles observed, improvement in belt usage by pickup occupants would have more impact upon overall usage numbers and have greater potential for saving lives and reducing serious injuries.

Overall seatbelt usage rates for the other vehicle types were much higher. Minivan occupants exhibited the highest unweighted usage rate (66.5 percent); car occupants (62.7 percent) and sport utility vehicle occupants (61.5 percent) followed them. The difference in usage by occupants of sport utility vehicles and pickup trucks is striking since such vehicles are often very similar in size and use. As previously noted, some of this difference may be attributed to the very high percentage of male pickup truck drivers; most of the difference is attributable to the exclusion of pickups from the Indiana restraint laws.

3.4 Restraint Usage by Roadway Class

The design of Indiana's survey in 1994 anticipated that safety restraint usage might vary depending on both the roadway classification and the degree of urbanization of the location. Low population or low Vehicle Miles Traveled (VMT) counties were not excluded from inclusion in the sample of counties as permitted by NHTSA regulations nor were roadways, which are outside the highway system excluded. Thus, Indiana's survey permits the investigation of whether restraint usage is dependent on the functional type of roadway. Table 4 displays the relationships between the weighted restraint usage roadway class and urbanization as quantified by total county VMT. Overall, restraint usage rates were higher in urban areas with the largest difference observed between local roads and streets (54.8 percent on urban local streets versus 40.4 percent on rural local roads). Freeways had the highest usage rates of any roadway class and rates varied little between rural (70.1 percent) and urban locations (70.7 percent). The decline in usage rates between 1998 and 1999 was small for freeway traffic (1.5 percent for rural freeways and just 0.8 percent for urban freeways). On the other hand, the percentage restrained declined 9.3 percent on urban local streets but only 2.4 percent on local rural roads.

In the 1998 survey, there were practically no differences among the usage rates for the different classes of urban roads, excluding urban freeways, for each of the VMT strata groups, but there were large differences between strata groups for each of the roadway classes. The usage patterns for the 1999 survey were different as rates declined for urban arterials and urban collectors with rates significantly below the urban freeway rates. As in 1998, the usage rates for Medium VMT counties were higher than for Low VMT counties, and rates for High VMT counties were higher than for Medium VMT counties. For rural roadways, there were significant overall differences by class with arterials having the highest rates (56.5 percent), followed by collectors with 47.3 percent and local roads with 40.4 percent.

Table 4: Indiana 1999 Weighted Restraint Usage by Roadway Class, Strata and Vehicle Type

Vehicle Type	Rural Roads				Urban Roads			
	County VMT Strata			Entire State	County VMT Strata			Entire State
	High	Medium	Low		High	Medium	Low	
		Rural Freeways				Urban Freeways		
Cars	80.5%	77.5%	70.1%	74.8%	75.6%	71.7%	83.6%	75.2%
Pickups	58.0%	46.4%	41.0%	46.2%	43.9%	48.8%	56.3%	45.2%
Other Pass.	81.1%	80.7%	66.8%	74.7%	75.5%	63.9%	55.6%	72.8%
All Pass.	78.1%	73.4%	63.8%	70.1%	71.8%	65.3%	72.1%	70.7%
		Rural Arterials				Urban Arterials		
Cars	68.5%	64.1%	61.5%	63.2%	64.8%	64.1%	55.2%	63.4%
Pickups	48.5%	34.2%	26.4%	31.8%	39.8%	32.8%	20.8%	35.2%
Other Pass.	79.2%	69.0%	54.5%	62.0%	67.6%	67.2%	55.2%	65.9%
All Pass.	67.5%	58.7%	52.7%	56.5%	62.9%	59.9%	45.9%	59.9%
		Rural Collectors				Urban Collectors		
Cars	59.2%	62.8%	52.9%	57.2%	69.8%	49.2%	52.2%	61.2%
Pickups	27.6%	25.8%	23.8%	25.0%	33.9%	20.0%	9.6%	26.3%
Other Pass.	47.2%	58.5%	50.0%	52.4%	63.6%	45.8%	34.4%	54.2%
All Pass.	47.5%	52.1%	44.1%	47.3%	64.8%	42.7%	35.4%	54.1%
		Rural Local Roads				Urban Local Streets		
Cars	52.2%	57.6%	42.6%	46.7%	63.5%	57.5%	49.4%	59.8%
Pickups	45.2%	20.4%	16.9%	20.1%	42.0%	25.3%	16.6%	33.7%
Other Pass.	70.6%	57.5%	41.5%	47.5%	53.3%	53.6%	54.7%	53.6%
All Pass.	54.2%	49.9%	35.7%	40.4%	59.3%	52.6%	40.9%	54.8%

Other Pass. = Large Vans, Minivans and Sport-Utility Vehicles

All Pass. = All non-commercial Passenger vehicles

Source: Roadside Observation Survey of Safety Belt and Motorcycle Helmet Use in Indiana, 1999

Table 5 displays the unweighted restraint usage rates for both 1998 and 1999 for the same roadway classes as in Table 4. In addition, the number of sites and number of observations for each year are shown.

Table 5: Indiana 1998-1999 Unweighted Restraint Usage by Roadway Class and Vehicle Type

Vehicle Type	Rural Roads							Urban Roads						
	# Sites	# Obs.	% Res.	# Sites	# Obs.	% Res.	99' - 98'	# Sites	# Obs.	% Res.	# Sites	# Obs.	% Res.	99' - 98'
Rural Freeways								Urban Freeways						
Cars	16	1,800	79.0%	16	1,677	75.7%	-3.3%	14	2,117	76.1%	14	2,165	74.7%	-1.3%
Pickups		590	44.7%		577	44.0%	-0.7%		536	49.1%		607	47.1%	-2.0%
Minivans		310	81.0%		320	80.6%	-0.3%		420	76.7%		430	74.9%	-1.8%
Large Vans		76	40.8%		81	51.9%	11.1%		75	48.0%		108	49.1%	1.1%
SUV		300	72.3%		363	74.7%	2.3%		358	75.1%		498	71.9%	-3.3%
All Pass.	16	3,076	71.0%	16	3,018	69.4%	-1.6%	14	3,506	71.3%	14	3,808	69.2%	-2.1%
Rural Arterials								Urban Arterials						
Cars	20	3,154	68.8%	21	3,481	63.9%	-4.9%	27	5,805	68.7%	27	5,942	63.0%	-5.7%
Pickups		1,267	33.1%		1,506	31.7%	-1.3%		1,474	36.3%		1,501	32.2%	-4.1%
Minivans		657	69.9%		620	71.0%	1.1%		852	73.1%		877	68.0%	-5.2%
Large Vans		80	48.8%		157	40.1%	-8.6%		149	34.2%		197	38.1%	3.8%
SUV		419	61.8%		628	61.0%	-0.8%		712	62.1%		1,003	65.4%	3.3%
All Pass.	20	5,577	60.0%	21	6,392	56.1%	-3.9%	27	8,992	62.7%	27	9,520	58.4%	-4.4%
Rural Collectors								Urban Collectors						
Cars	36	3,347	62.4%	35	3,083	57.8%	-4.6%	8	972	67.5%	8	1,010	62.4%	-5.1%
Pickups		1,650	28.5%		1,687	25.0%	-3.5%		253	32.8%		246	23.6%	-9.2%
Minivans		676	67.5%		515	60.6%	-6.9%		194	76.3%		185	60.0%	-16.3%
Large Vans		98	39.8%		141	33.3%	-6.5%		53	26.4%		42	38.1%	11.7%
SUV		477	54.5%		577	53.6%	-1.0%		147	64.6%		176	54.0%	-10.6%
All Pass.	36	6,248	53.0%	35	6,003	47.8%	-5.2%	8	1,619	61.5%	8	1,659	54.9%	-6.7%
Rural Local Roads								Urban Local Streets						
Cars	20	1,715	50.3%	20	1,766	47.1%	-3.2%	20	2,321	68.1%	20	2,312	57.8%	-10.3%
Pickups		746	20.4%		831	19.7%	-0.7%		478	32.0%		598	25.8%	-6.2%
Minivans		290	49.0%		354	56.5%	7.5%		394	69.5%		394	55.8%	-13.7%
Large Vans		41	39.0%		67	20.9%	-18.1%		65	44.6%		57	22.8%	-21.8%
SUV		244	49.6%		279	44.1%	-5.5%		223	60.5%		312	55.4%	-5.1%
All Pass.	20	3,036	42.6%	20	3,297	40.4%	-2.2%	20	3,481	62.4%	20	3,673	51.6%	-10.7%
All Rural Roads								All Urban Roads						
Cars	92	10,016	65.3%	92	10,007	61.0%	-4.3%	69	11,215	69.9%	69	11,429	64.1%	-5.7%
Pickups		4,253	30.7%		4,601	28.6%	-2.1%		2,741	37.7%		2,952	33.2%	-4.5%
Minivans		1,933	67.7%		1,809	66.9%	-0.8%		1,860	73.5%		1,886	66.2%	-7.3%
Large Vans		295	42.4%		446	37.2%	-5.2%		342	38.0%		404	38.9%	0.8%
SUV		1,440	59.5%		1,847	58.8%	-0.7%		1,440	65.3%		1,989	64.5%	-0.9%
All Pass.	92	17,937	56.5%	92	18,710	52.8%	-3.7%	69	17,598	64.2%	69	18,660	58.9%	-5.3%

Obs. = Number of Observations - Front Seat Outboard Occupants

% Res. = Percent Restrained - Restraint Usage unknown not included

All Pass. = All non-commercial Passenger vehicles

SUV = Sport-Utility Vehicles

The unweighted safety belt usage rate declined 1.7 percent from 1998 for occupants traveling on rural freeways and declined 2.1 percent for urban freeways. Larger decreases in usage rates were prevalent for the other roadway classes. The greatest decreases in usage rates were found for urban collectors (6.7 percent), and urban local streets (10.7 percent).

Male and female drivers exhibited somewhat different usage patterns by roadway class. Overall, female drivers had a 76.1 percent usage rate on freeways while males had a lower restraint rate of 65.4 percent. There was a greater gender difference for local roads: 56.4 percent for female drivers and 38.4 percent for male drivers. The difference was greatest for local rural roads: 51.4 percent restrained for female and only 32.2 percent for male drivers.

3.5 Restraint Usage by Geographic Region

The decline in usage rates in 1999 prompted the desire to examine whether it was a statewide phenomenon or whether some regions of the state accounted for more of the decline than other regions. Geographic region was not one of the design parameters in the redesign of the survey in 1994 so much caution must be exercised in generalizing any findings to counties outside the 24 in the survey. It is plausible that restraint rates for counties within the sample that lie within a geographic region may be representative of neighboring counties, but such an assumption may prove to be incorrect. The 24 counties were grouped into six clusters on the basis of distance between counties. With the exception of the “Southern” and East-Central/South clusters, all counties in a cluster share a border with at least one other county in the cluster. With the single exception of Henry County, all counties have no common border with any county from another cluster.

The regions with the highest usage rates in 1998 (Northeast and Indianapolis Metro) had the lowest percentage of rural data, the lowest percentage of pickup data and the highest percentage of freeway data. Each of these factors is associated with higher restraint usage rates. Both of these regions also include a Strata 1 county. The regions with the lowest usage rates in 1998 (Southern and East-Central/South) are represented by predominately Strata 3 counties, and had the highest percentages of pickup data. The East-Central/South region had the highest percentage of rural data (89.7 percent) and the lowest percentage of freeway data. Thus the rank ordering of usage rates in 1998 for both cars only and all passenger vehicles is predictable from the demographic factors of percentage of pickups, percentage rural, percentage freeway and VMT strata representation.

The 1999 restraint patterns deviate somewhat from the 1998 patterns. There were significant declines in the usage rates in the Indianapolis Metro region and the West-Central North region. It is plausible that the extensive media attention to the Standard Safety Belt law and visible enforcement efforts during the summer of 1998 in the Indianapolis metropolitan area led to increases in the usage rates during September 1998. The Indianapolis media did not devote as much attention to the court’s upholding of the law during the summer of 1999. The declines for the Southern region are due primarily to declines in Clark County. Once again it is plausible that there was stronger enforcement of the Standard law and more media attention in Clark County during the summer of 1998 than occurred in the more rural counties of southern Indiana.

Table 6: Geographic Region Comparisons: 1998 to 1999
(Unweighted Restraint Usage Rates)

1998 Survey								
Region	Vehicle Count	Pickup %	Rural %	Freeway %	% Rest.			
					Cars	All Pass.		
East-Central/South	3,816	27.0%	89.7%	10.9%	59.1%	47.5%		
Southern	3,019	24.4%	39.9%	17.2%	63.2%	55.0%		
West-Central/North	5,285	22.6%	62.6%	13.2%	68.9%	61.4%		
Northwest	5,669	18.3%	54.5%	16.0%	66.1%	60.9%		
Northeast	3,398	15.3%	31.6%	24.6%	72.9%	68.3%		
Indianapolis Metro	7,071	17.5%	26.0%	25.3%	71.8%	65.0%		
Indiana	28,258	20.4%	49.3%	18.3%	67.7%	60.3%		

1999 Survey							Change in Percent Restrained	
Region	Vehicle Count	Pickup %	Rural %	Freeway %	% Rest.		Cars	All Pass.
					Cars	All Pass.		
East-Central/South	4,555	27.6%	87.8%	10.9%	57.3%	47.4%	-1.8%	-0.1%
Southern	3,190	25.0%	37.2%	19.1%	56.3%	49.0%	-6.9%	-6.0%
West-Central/North	4,987	22.2%	65.0%	12.5%	61.7%	54.0%	-7.2%	-7.4%
Northwest	5,895	19.1%	57.2%	14.8%	65.8%	62.3%	-0.3%	1.4%
Northeast	3,271	14.9%	29.4%	27.3%	70.2%	65.8%	-2.7%	-2.5%
Indianapolis Metro	7,597	18.6%	24.2%	20.5%	63.5%	56.5%	-8.3%	-8.5%
Indiana	29,878	21.0%	49.5%	17.5%	62.7%	55.9%	-5.0%	-4.4%

Counties and Strata included in each Region:

East-Central/South: Decatur(3), Franklin(3), Jackson(3), Henry(2), Ripley(3)

Southern: Clark(2), Daviess(3), Gibson(3), Perry(3)

West-Central/North: Clinton(3), Fountain(3), Howard(2), Tippecanoe(2), Tipton(3)

Northwest: LaPorte(1), Marshall(2), Newton(3), Porter(1)

Northeast: DeKalb(3), Allen(1)

Indianapolis Metro: Hendricks(2), Hancock(2), Marion(1), Morgan(2)

3.6 Motorcycles and Helmet Use

As in 1998, passengers exhibited a higher helmet usage rate (41.3 percent unweighted) than drivers (38.8 percent). These unweighted usage rates are higher than the 38.5 percent rate for passengers and 33.5 percent for drivers in 1998, but lower than the 48.7 percent rate for passengers and 41.7 percent for drivers observed in 1997. Table 7 displays the helmet usage patterns by role and roadway class for 1999 data. On rural interstate roads, helmet use was 58.3 percent, lower than the 65.5 percent observed in 1998. However, helmet use on urban interstate roads was 56.7 percent compared to only 41.9 percent in 1998. For other roadway classes, helmet use varied between 20.6 and 41.5 percent. Thus it still appears to be important to distinguish freeway usage from other motorcycle travel.

Using the estimation procedures described in Appendix B, Section B.3 of the 1998 report, an overall weighted statewide helmet usage rate of 37.6 percent was calculated, an increase from 33.4 percent in 1998. The weighted rate for OFF-SITE data was estimated as 31.8 percent and the weighted rate for ON-SITE data was 36.8 percent.

Table 7: Indiana 1999 Unweighted Motorcycle Helmet Usage by Role and Roadway Class

		Driver				Passenger			Occupants			
Rur/Urb	Roadway Class	NH	H	% H	Total Drivers	NH	H	% H	NH	H	% H	Total Occupants
Rural					All Motorcycle Data							
	Freeway	34	41	54.7%	75	6	15	71.4%	40	56	58.3%	96
	Arterials	203	127	38.5%	330	58	49	45.8%	261	176	40.3%	437
	Collectors	74	44	37.3%	118	29	13	31.0%	103	57	35.6%	160
	Locals	28	18	39.1%	46	3	4	57.1%	31	22	41.5%	53
	TOTAL	339	230	40.4%	569	96	81	45.8%	435	311	41.7%	746
Urban	Freeway	32	42	56.8%	74	7	9	56.3%	39	51	56.7%	90
	Arterials	191	91	32.3%	282	42	16	27.6%	233	107	31.5%	340
	Collectors	16	11	40.7%	27	2	1	33.3%	18	12	40.0%	30
	Locals	22	7	24.1%	29	5	0	0.0%	27	7	20.6%	34
	TOTAL	261	151	36.7%	412	56	26	31.7%	317	177	35.8%	494
TOTAL	Freeway	66	83	55.7%	149	13	24	64.9%	79	107	57.5%	186
	Arterials	394	218	35.6%	612	100	65	39.4%	494	283	36.4%	777
	Collectors	90	55	37.9%	145	31	14	31.1%	121	69	36.3%	190
	Locals	50	25	33.3%	75	8	4	33.3%	58	29	33.3%	87
	TOTAL	600	381	38.8%	981	152	107	41.3%	752	488	39.4%	1,240
Rural					Off-Site Data							
	Freeway	17	36	67.9%	53	5	14	73.7%	22	50	69.4%	72
	Arterials	34	15	30.6%	49	8	6	42.9%	42	21	33.3%	63
	Collectors	6	2	25.0%	8	1	0	0.0%	7	2	22.2%	9
	Locals	3	1	25.0%	4	0	1	100.0%	3	2	40.0%	5
	TOTAL	60	54	47.4%	114	14	21	60.0%	74	75	50.3%	149
Urban	Freeway	16	29	64.4%	45	6	5	45.5%	22	34	60.7%	56
	Arterials	100	40	28.6%	140	22	8	26.7%	122	48	28.2%	170
	Collectors	5	7	58.3%	12	2	1	33.3%	7	8	53.3%	15
	Locals	13	1	7.1%	14	4	0	0.0%	17	1	5.6%	18
	TOTAL	134	77	36.5%	211	34	14	29.2%	168	91	35.1%	259
TOTAL	Freeway	33	65	66.3%	98	11	19	63.3%	44	84	65.6%	128
	Arterials	134	55	29.1%	189	30	14	31.8%	164	69	29.6%	233
	Collectors	11	9	45.0%	20	3	1	25.0%	14	10	41.7%	24
	Locals	16	2	11.1%	18	4	1	20.0%	20	3	13.0%	23
	TOTAL	194	131	40.3%	325	48	35	42.2%	242	166	40.7%	408
Rural					On-Site Data							
	Freeway	17	5	22.7%	22	1	1	50.0%	18	6	25.0%	24
	Arterials	169	112	39.9%	281	50	43	46.2%	219	155	41.4%	374
	Collectors	68	42	38.2%	110	28	13	31.7%	96	55	36.4%	151
	Locals	25	17	40.5%	42	3	3	50.0%	28	20	41.7%	48
	TOTAL	279	176	38.7%	455	82	60	42.3%	361	236	39.5%	597
Urban	Freeway	16	13	44.8%	29	1	4	80.0%	17	17	50.0%	34
	Arterials	91	51	35.9%	142	20	8	28.6%	111	59	34.7%	170
	Collectors	11	4	26.7%	15	0	0	NA	11	4	26.7%	15
	Locals	9	6	40.0%	15	1	0	0.0%	10	6	37.5%	16
	TOTAL	127	74	36.8%	201	22	12	35.3%	149	86	36.6%	235
TOTAL	Freeway	33	18	35.3%	51	2	5	71.4%	35	23	39.7%	58
	Arterials	260	163	38.5%	423	70	51	42.1%	330	214	39.3%	544
	Collectors	79	46	36.8%	125	28	13	31.7%	107	59	35.5%	166
	Locals	34	23	40.4%	57	4	3	42.9%	38	26	40.6%	64
	TOTAL	406	250	38.1%	656	104	72	40.9%	510	322	38.7%	832

H = Helmeted

NH = Not Helmeted

% H = Percent Helmeted

4.0 Conclusions and Recommendations

The primary findings of the 1998 safety belt survey were that the Indiana usage rate increased by more than ten percent from 51.1 percent in 1997 to 61.8 percent in 1998. Unfortunately, approximately half of these gains were lost in 1999. The decline in 1999 was slightly greater for passenger car occupants and less for occupants of sport-utility vehicles. The passage of the standard safety belt law, which went into effect on July 1, 1998, was the most likely cause for the significant improvement in safety belt usage in 1998. Delay and possible unevenness across geographic regions in the enforcement of the standard law may account for some of the decline in usage in 1999.

The usefulness of Operation Pull Over in encouraging safety belt use needs to be emphasized by the Governor's Council. The use of the annual safety belt data to evaluate the Operation Pull Over activities in the 24 counties represented in the survey should be considered. The wide support that was demonstrated for the 1998 law in legislative committee hearings may have encouraged the public to make a habit of wearing safety belts. The Council should draw on this support in continuing efforts to educate Indiana's citizens concerning the life saving benefits of safety belts.

Education and enforcement efforts need to be targeted at those segments of the population that have demonstrated low usage rates. These include young adults and occupants of large vans and pickup trucks. It is suggested that the state amend the current safety belt law to apply it to the occupants of pickups and other vehicles currently licensed as light trucks. ATC has used NHTSA estimates of safety restraint effectiveness by vehicle type and occupant seating location to estimate lives that could have been saved if safety belts were used. For pickup occupants killed in 1996 and 1997 crashes, it is estimated that 27 lives would have been saved each year if the restraint usage rate were the same as for cars (Indiana 1997 Crash Facts).

The distinctively different usage rates for male drivers and male front-seat passengers when riding with a female driver or passenger should be further studied. This difference could possibly be utilized in targeting media messages to high-risk male drivers.

Strict enforcement of the Indiana Child Restraint Law should help in increasing the usage rates of children and teenagers. It is recommended that data collection efforts be initiated to monitor the safety restraint usage of these age groups. Such data would be useful in evaluating the effects of these laws on saving lives and reducing injuries.

The analysis of decreases in restraint usage rates by geographic region revealed significant declines in some regions of the state and much smaller declines in other regions. Consideration should be given to augmenting the sample of counties included in the year 2000 survey to improve the validity of regional analyses and relate usage rates to Operational Pull Over data.

5.0 References

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